

THE PROBLEM

JOB OFFER

Major manufacturer of space shuttles seeks **SENSORY ACUITY TEST DEVELOPERS**

Navspat, an aerospace industry leader, is seeking four sensory acuity test developers. These tests will help Navspat to recruit individuals with highly attuned senses who are able to detect any suspicious elements (objects, sounds, smells, tastes, variations in temperature or vibration) during space flights.

RESPONSIBILITY

The developers must develop a test to evaluate sensory acuity and then they must take the test themselves.

REQUIREMENTS

In particular each developer must:

- Complete a personal sensory acuity sheet.
- Analyze the results of his or her test in order to evaluate its appropriateness.

PERSONAL QUALITIES SOUGHT

- Creativity
- Methodical approach to his or her work
- Concern for health and safety

In this simulation exercise, you are to assume the role of a sensory acuity test developer who is responding to Navspat's job offer.

Notes

Name: _____

Group: _____

CREATING THE CONTEXT

I ask myself questions

Assigned sense: _____

1. What is the function of a sensory organ?

2. What is sensory acuity?

3. What is the goal of a sensory acuity test?

4. What is the decibel scale?

5. What is the focal point of a converging lens?

6. Which structure of the eye serves as a converging lens?

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Name: _____

Group: _____

CREATING THE CONTEXT *(continued)*

7. Which organ is associated with the sense that was assigned to you?

8. List the principal functions of the organ associated with the sense that was assigned to you.

I must

9. What is the goal of the problem to solve?

10. What is the independent variable of the problem to solve?

11. What is the dependent variable of the problem to solve?

I think

12. Which function of the sense assigned to you could you test?

13. How could your test measure the acuity of this sense? Formulate a hypothesis.

Reflection

Do I understand the following concepts:

• sensory receptors?

Yes

No

☐☐

• the decibel scale?

☐☐

• the focal point of a lens?

☐☐

Name: _____

Group: _____

PLANNING THE PROBLEM SOLVING *(continued)*

4. What are the safety rules you must consider when administering your test?

5. Create a table in which to record the results of each test for each subject, his or her average and the class average.

Reflection

Have I envisaged other possible ways to test sensory acuity?

Yes

☐

No

☐

Name: _____

Group: _____

ANALYZING RESULTS AND DRAWING CONCLUSIONS

I analyze my results

1. Do the results of your test really allow you to evaluate the sensory acuity of your classmates? Justify your answer. To do so, ask yourself whether the results are varied, and whether they should be.

2. Did you make any mistakes when administering the test? If yes, did they affect the test results? Justify your answer.

3. What are the strengths and weaknesses of your test?

4. How could you improve your test?

I draw my conclusions

5. What conclusion can you draw from your test? Was your hypothesis correct? Would you recommend your test to the space shuttle manufacturer?

Name: _____

Group: _____

MY SENSORY ACUITY SHEET

Sensory acuity tests			
Sense tested	Function evaluated	Result	Class average
Vision	_____	_____	_____
	_____	_____	_____
Hearing	_____	_____	_____
	_____	_____	_____
Touch	_____	_____	_____
	_____	_____	_____
Smell	_____	_____	_____
	_____	_____	_____
Taste	_____	_____	_____
	_____	_____	_____

1. Do I have one sense that is more highly developed than the others? If yes, which one?

2. Do some of the occupations or professions that interest me rely on one or more senses in particular? If yes, which occupations or professions are they? Which sense is used most?

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Name: _____

Group: _____

MY EVALUATION

Use the evaluation grid on the next page to do a self-evaluation. Write A, B, C, D or E in the appropriate space.

SSC1 Seeks answers or solutions to scientific or technological problems				
Criteria*	Observable indicators	Me	Teacher	Comments
1	Creating the context		<input type="checkbox"/> With help	
	Definition of the goal and formulation of a hypothesis			
2	Planning the problem solving		<input type="checkbox"/> With help	
	Planning of test: materials and procedure			
3	Initiating the problem solving		<input type="checkbox"/> With help	
	Administration of test: results and safety			
4	Analyzing results and drawing conclusions		<input type="checkbox"/> With help	
	Analysis of the appropriateness of the test			

* Evaluation criteria

- 1 Appropriate representation of the situation
- 2 Development of a suitable plan of action for the situation
- 3 Appropriate implementation of the plan of action
- 4 Development of relevant conclusions, explanations or solutions

EVALUATION GRID

✓ SSC1 Seeks answers or solutions to scientific or technological problems

Criteria*	Observable indicators	A	B	C	D	E
1	CREATING THE CONTEXT Definition of the goal and formulation of a hypothesis	The goal and hypothesis are very clearly stated and linked to the problem to solve.	The goal and hypothesis are clearly stated and linked to the problem to solve.	The goal and hypothesis are more or less clearly stated or are not linked to the problem to solve.	The goal and hypothesis are not clearly stated and are not linked to the problem to solve.	The work needs to be redone.
2	PLANNING THE PROBLEM SOLVING Planning of test: materials and procedure	The list of materials is complete. The procedure is very clearly stated and appropriate.	The list of materials is almost complete. The procedure is clearly stated and appropriate.	Several elements are missing in the list of materials OR the procedure is more or less clearly stated and appropriate.	Several elements are missing in the list of materials AND the procedure is poorly stated and inappropriate.	The work needs to be redone.
3	INITIATING THE PROBLEM SOLVING Administration of test: results and safety	The test is administered in a safe manner. All the results are adequately recorded.	The test is administered in a safe manner. Most of the results are adequately recorded.	The test is administered in a safe manner. Some results are adequately recorded.	The test is not administered in a safe manner OR the results are not adequately recorded.	The work needs to be redone.
4	ANALYZING RESULTS AND DRAWING CONCLUSIONS Analysis of the appropriateness of the test	The strengths and weaknesses are very clearly stated. The suggested improvements are appropriate.	The strengths and weaknesses are clearly stated. The suggested improvements are appropriate.	The strengths and weaknesses are more or less clearly stated OR the suggested improvements are not appropriate.	The strengths and weaknesses are more or less clearly stated AND the suggested improvements are not appropriate.	The work needs to be redone.

* Evaluation criteria

- 1 Appropriate representation of the situation
- 2 Development of a suitable plan of action for the situation
- 3 Appropriate implementation of the plan of action
- 4 Development of relevant conclusions, explanations or solutions